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Hierarchical gold nanostructure electrochemical immunosensor for CA 125 antigen detection based on silicon nanoparticles

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A sensitive electrochemical immunosensor was developed based on the three-dimensional gold electrode for detection of broad range of CA 125 antigen. The Gold Nanostructures (GNS) with large surface area are highly effective for detection of CA 125 cancer biomarker and through human serum. The sensing properties of GNS immunosensor was examined by cyclic voltammetry, differential pulse voltammetry and electrochemical impedance spectroscopy with ferricyanide as an electrochemical redox indicator. The developed sandwich electrochemical immunosensor offers an excellent response to detect CA 125 antigen with wide dynamic range from μgml^{-1} to fgml^{-1} with low detection limit of 1 fgml^{-1} . The immunosensor is stable, reproducible for the clinical serum samples tested with the developed immunosensor. The prepared immunosensor has the potential to detect CA 125 biomarker as a control and in clinical samples which show abnormally high or low levels of CA 125 in serum.

Biography

Saima Rafique is currently working as an Assistant Professor in the Department of Physics at Air University, Pakistan. Her major interest is the development of nanomaterial and device such as immunosensors for primal detection of cancer and their clinical trials.

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